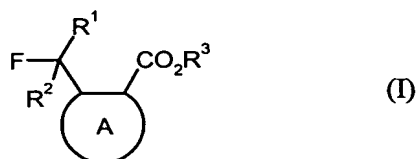


Claims:

1. Process for preparing fluoromethyl-substituted heterocycles of the formula (I)



5 in which

R¹ is hydrogen, fluorine or chlorine,

R² is hydrogen, fluorine or chlorine,

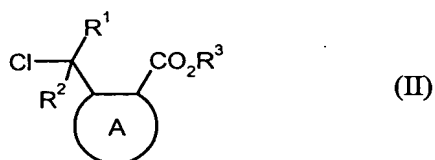
R³ is C₁-C₆-alkyl,

10 A is a 5-membered heterocycle selected from the group of pyrazole which is substituted by R⁴ in the 1-position, thiazole which is substituted by R⁴ in the 2-position and oxazole which is substituted by R⁴ in the 2-position,

R⁴ is C₁-C₄-alkyl, C₃-C₆-cycloalkyl, C₁-C₄-alkylthio-C₁-C₄-alkyl, C₁-C₄-alkoxy-C₁-C₄-alkyl or phenyl,

15 characterized in that

- a) chloromethyl-substituted heterocycles of the formula (II)



in which R¹, R², R³ and A are each as defined above

20 are converted in the presence of a fluorinating agent and optionally in the presence of a diluent.

2. Process according to Claim 1, characterized in that the starting materials used are chloromethyl-substituted heterocycles of the formula (II),

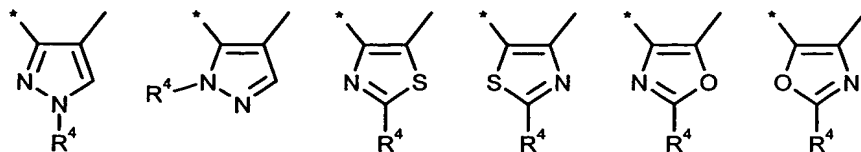
in which

25 R¹ is hydrogen, fluorine or chlorine,

R² is hydrogen, fluorine or chlorine,

R³ is C₁-C₄-alkyl,

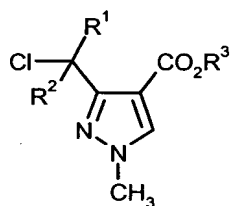
A is a 5-membered heterocycle selected from the group of



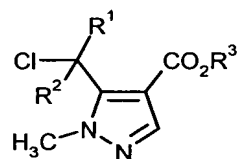
where in each case the bond marked by * is joined to the $-CCIR^1R^2$ group and the other bond to the ester group,

R^4 is methyl, ethyl, n-propyl, isopropyl, cyclopropyl, cyclopentyl, cyclohexyl or phenyl.

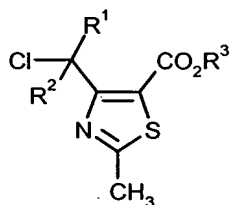
3. Process according to one of Claims 1 and 2, characterized in that the starting materials used are one of the following compounds of the formulae (II-a), (II-b), (II-c) or (II-d)



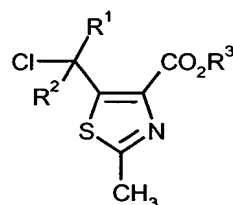
(II-a)



(II-b)



(II-c)



(II-d)

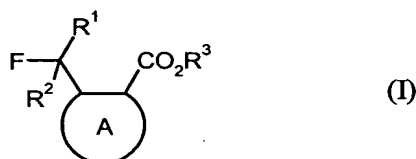
in which R^1 , R^2 and R^3 in each case are as defined in Claim 1 or 2.

4. Process according to Claim 3, characterized in that R^1 is chlorine, R^2 is hydrogen and R^3 is methyl or ethyl.

5. Process according to one or more of Claims 1 to 4, characterized in that the fluorinating agent used is an alkali metal fluoride, cobalt(III) fluoride, halogen fluoride, antimony fluoride, molybdenum fluoride, hydrogen fluoride, hydrogen fluoride/pyridine mixture, tertiary ammonium hydrofluoride or trialkylamine hydrofluoride of the general formula $n \text{ HF} / \text{N(Alk)}_3$ (where n is 1, 2 or 3, and Alk is $\text{C}_1\text{-C}_4\text{-alkyl}$).

6. Process according to one or more of Claims 1 to 5, characterized in that the fluorinating agent used is $3 \text{ HF} / \text{N(Et)}_3$ (Franz reagent), $3 \text{ HF} / \text{N(n-Bu)}_3$ or HF/pyridine (Olah's reagent).

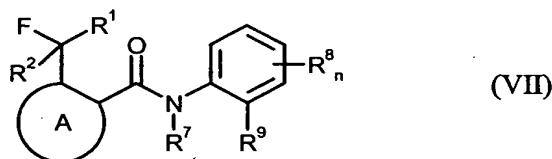
7. Process according to one or more of Claims 1 to 6, characterized in that the fluorinating agent used is 3 HF / N(Et)₃ (Franz reagent) or 3 HF / N(n-Bu)₃.
8. Process according to one or more of Claims 1 to 7, characterized in that it is carried out at temperatures of 80°C to 170°C.
9. Process according to one or more of Claims 1 to 8, characterized in that it is carried out at temperatures of 120°C to 150°C.
10. Use of fluoromethyl-substituted heterocycles of the formula (I)



in which

- R¹ is hydrogen, fluorine or chlorine,
 R² is hydrogen, fluorine or chlorine,
 R³ is C₁-C₆-alkyl,
 A is a 5-membered heterocycle selected from the group of pyrazole which is substituted by R⁴ in the 1-position, thiazole which is substituted by R⁴ in the 2-position and oxazole which is substituted by R⁴ in the 2-position,
 R⁴ is C₁-C₄-alkyl, C₃-C₆-cycloalkyl, C₁-C₄-alkylthio-C₁-C₄-alkyl, C₁-C₄-alkoxy-C₁-C₄-alkyl or phenyl

to prepare fungicidally active carboxamides of the formula (VII)



in which

- R¹, R² and A are each as defined above,
 R⁷ is hydrogen, C₁-C₈-alkyl, C₁-C₆-alkylsulphinyl, C₁-C₆-alkylsulphonyl, C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-cycloalkyl; C₁-C₆-haloalkyl, C₁-C₄-haloalkylthio, C₁-C₄-haloalkylsulphinyl, C₁-C₄-haloalkylsulphonyl, halo-C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms; formyl, formyl-C₁-C₃-alkyl, (C₁-C₃-alkyl)carbonyl-C₁-C₃-alkyl, (C₁-C₃-alkoxy)carbonyl-C₁-C₃-alkyl; halo-(C₁-C₃-alkyl)carbonyl-C₁-C₃-alkyl, halo-(C₁-C₃-alkoxy)carbonyl-C₁-C₃-alkyl having in each case 1 to 13 fluorine, chlorine and/or

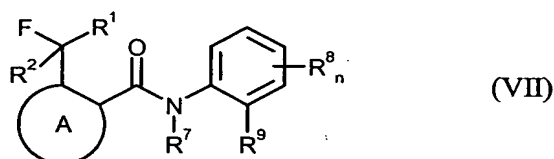
- bromine atoms; (C₁-C₈-alkyl)carbonyl, (C₁-C₈-alkoxy)carbonyl, (C₁-C₄-alkoxy-C₁-C₄-alkyl)carbonyl, (C₃-C₈-cycloalkyl)carbonyl; (C₁-C₆-haloalkyl)carbonyl, (C₁-C₆-haloalkoxy)carbonyl, (halo-C₁-C₄-alkoxy-C₁-C₄-alkyl)carbonyl, (C₃-C₈-halo-cycloalkyl)carbonyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms; or -C(=O)C(=O)R¹⁰, -CONR¹¹R¹² or -CH₂NR¹³R¹⁴,
- 5 R⁸ is hydrogen, fluorine, chlorine, methyl, isopropyl, methylthio or trifluoromethyl,
 n is 1, 2, 3 or 4, preferably 1 or 2,
 R⁹ is optionally mono- to pentasubstituted phenyl having identical or different substituents which are selected from halogen, C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₂-haloalkyl or C₁-C₂-haloalkoxy having in each case 1 to 5 fluorine, chlorine and/or
 10 bromine atoms, hydroxyimino-C₁-C₄-alkyl, C₁-C₄-alkoxyimino-C₁-C₄-alkyl, C₁-C₄-haloalkoxyimino-C₁-C₄-alkyl, or, in the case of two adjacent substituents, from difluoromethylenedioxy or tetrafluoroethylenedioxy,
 or is C₃-C₁₀-cycloalkyl or C₃-C₁₀-bicycloalkyl which is in each case optionally
 15 mono- to tetrasubstituted, identically or differently, by halogen and/or C₁-C₄-alkyl, or unsubstituted C₂-C₂₀-alkyl, or C₁-C₂₀-alkyl which is mono- or polysubstituted, identically or differently, by fluorine, chlorine, bromine, iodine and/or C₃-C₆-cycloalkyl, in which case the cycloalkyl moiety may itself optionally be mono- to tetrasubstituted, identically or differently, by fluorine, chlorine, bromine, iodine,
 20 C₁-C₄-alkyl and/or C₁-C₄-haloalkyl,
 or is C₂-C₂₀-alkenyl or C₂-C₂₀-alkynyl which is in each case optionally mono- or polysubstituted, identically or differently, by fluorine, chlorine, bromine, iodine and/or C₃-C₆-cycloalkyl in which case the cycloalkyl moiety may itself optionally be mono- to tetrasubstituted, identically or differently, by fluorine, chlorine, bromine, iodine, C₁-C₄-alkyl and/or C₁-C₄-haloalkyl,
 25 R¹⁰ is hydrogen, C₁-C₈-alkyl, C₁-C₈-alkoxy, C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-cycloalkyl; C₁-C₆-haloalkyl, C₁-C₆-haloalkoxy, halo-C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-halo-cycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms,
 R¹¹ and R¹² are each independently hydrogen, C₁-C₈-alkyl, C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-cycloalkyl; C₁-C₈-haloalkyl, halo-C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-halocycloalkyl
 30 having in each case 1 to 9 fluorine, chlorine and/or bromine atoms,
 R¹¹ and R¹² are also, together with the nitrogen atom to which they are bonded, a saturated heterocycle having 5 to 8 ring atoms which is optionally mono- or polysubstituted, identically or differently, by halogen or C₁-C₄-alkyl, and the heterocycle may contain
 35 1 or 2 further, nonadjacent heteroatoms from the group of oxygen, sulphur and NR¹⁵,

R^{13} and R^{14} are each independently hydrogen, C_1 - C_8 -alkyl, C_3 - C_8 -cycloalkyl; C_1 - C_8 -haloalkyl, C_3 - C_8 -halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms,

R^{13} and R^{14} are also, together with the nitrogen atom to which they are bonded, a saturated heterocycle having 5 to 8 ring atoms which is optionally mono- or polysubstituted, identically or differently, by halogen or C_1 - C_4 -alkyl, and the heterocycle may contain 1 or 2 further, nonadjacent heteroatoms from the group of oxygen, sulphur and NR^{15} ,

R^{15} is hydrogen or C_1 - C_6 -alkyl.

11. Process for preparing fungicidally active carboxamides of the formula (VII)



in which

R^1 is hydrogen, fluorine or chlorine,

R^2 is hydrogen, fluorine or chlorine,

A is a 5-membered heterocycle selected from the group of pyrazole which is substituted by R^4 in the 1-position, thiazole which is substituted by R^4 in the 2-position and oxazole which is substituted by R^4 in the 2-position,

R^4 is C_1 - C_4 -alkyl, C_3 - C_6 -cycloalkyl, C_1 - C_4 -alkylthio- C_1 - C_4 -alkyl, C_1 - C_4 -alkoxy- C_1 - C_4 -alkyl or phenyl,

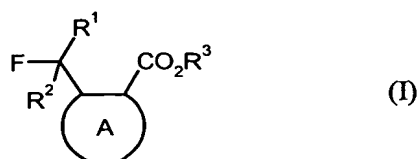
R^7 is hydrogen, C_1 - C_8 -alkyl, C_1 - C_6 -alkylsulphinyl, C_1 - C_6 -alkylsulphonyl, C_1 - C_4 -alkoxy- C_1 - C_4 -alkyl, C_3 - C_8 -cycloalkyl; C_1 - C_6 -haloalkyl, C_1 - C_4 -haloalkylthio, C_1 - C_4 -haloalkylsulphinyl, C_1 - C_4 -haloalkylsulphonyl, halo- C_1 - C_4 -alkoxy- C_1 - C_4 -alkyl, C_3 - C_8 -halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms; formyl, formyl- C_1 - C_3 -alkyl, (C_1 - C_3 -alkyl)carbonyl- C_1 - C_3 -alkyl, (C_1 - C_3 -alkoxy)carbonyl- C_1 - C_3 -alkyl; halo-(C_1 - C_3 -alkyl)carbonyl- C_1 - C_3 -alkyl, halo-(C_1 - C_3 -alkoxy)carbonyl- C_1 - C_3 -alkyl having in each case 1 to 13 fluorine, chlorine and/or bromine atoms; (C_1 - C_8 -alkyl)carbonyl, (C_1 - C_8 -alkoxy)carbonyl, (C_1 - C_4 -alkoxy- C_1 - C_4 -alkyl)carbonyl, (C_3 - C_8 -cycloalkyl)carbonyl; (C_1 - C_6 -haloalkyl)carbonyl, (C_1 - C_6 -haloalkoxy)carbonyl, (halo- C_1 - C_4 -alkoxy- C_1 - C_4 -alkyl)carbonyl, (C_3 - C_8 -halocycloalkyl)carbonyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms; or $-C(=O)C(=O)R^{10}$, $-CONR^{11}R^{12}$ or $-CH_2NR^{13}R^{14}$,

R^8 is hydrogen, fluorine, chlorine, methyl, isopropyl, methylthio or trifluoromethyl,

n is 1, 2, 3 or 4, preferably 1 or 2,

- R⁹ is optionally mono- to pentasubstituted phenyl having identical or different substituents which are selected from halogen, C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₂-haloalkyl or C₁-C₂-haloalkoxy having in each case 1 to 5 fluorine, chlorine and/or bromine atoms, hydroxyimino-C₁-C₄-alkyl, C₁-C₄-alkoxyimino-C₁-C₄-alkyl, C₁-C₄-haloalkoxyimino-C₁-C₄-alkyl, or, in the case of two adjacent substituents, from difluoromethylenedioxy or tetrafluoroethylenedioxy,
- or is C₃-C₁₀-cycloalkyl or C₃-C₁₀-bicycloalkyl which is in each case optionally mono- to tetrasubstituted, identically or differently, by halogen and/or C₁-C₄-alkyl, or unsubstituted C₂-C₂₀-alkyl, or C₁-C₂₀-alkyl which is mono- or polysubstituted, identically or differently, by fluorine, chlorine, bromine, iodine and/or C₃-C₆-cycloalkyl, in which case the cycloalkyl moiety may itself optionally be mono- to tetrasubstituted, identically or differently, by fluorine, chlorine, bromine, iodine, C₁-C₄-alkyl and/or C₁-C₄-haloalkyl,
- or is C₂-C₂₀-alkenyl or C₂-C₂₀-alkynyl which is in each case optionally mono- or polysubstituted, identically or differently, by fluorine, chlorine, bromine, iodine and/or C₃-C₆-cycloalkyl in which case the cycloalkyl moiety may itself optionally be mono- to tetrasubstituted, identically or differently, by fluorine, chlorine, bromine, iodine, C₁-C₄-alkyl and/or C₁-C₄-haloalkyl,
- R¹⁰ is hydrogen, C₁-C₈-alkyl, C₁-C₈-alkoxy, C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-cycloalkyl; C₁-C₆-haloalkyl, C₁-C₆-haloalkoxy, halo-C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-halo-cycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms,
- R¹¹ and R¹² are each independently hydrogen, C₁-C₈-alkyl, C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-cycloalkyl; C₁-C₈-haloalkyl, halo-C₁-C₄-alkoxy-C₁-C₄-alkyl, C₃-C₈-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms,
- R¹¹ and R¹² are also, together with the nitrogen atom to which they are bonded, a saturated heterocycle having 5 to 8 ring atoms which is optionally mono- or polysubstituted, identically or differently, by halogen or C₁-C₄-alkyl, and the heterocycle may contain 1 or 2 further, nonadjacent heteroatoms from the group of oxygen, sulphur and NR¹⁵,
- R¹³ and R¹⁴ are each independently hydrogen, C₁-C₈-alkyl, C₃-C₈-cycloalkyl; C₁-C₈-haloalkyl, C₃-C₈-halocycloalkyl having in each case 1 to 9 fluorine, chlorine and/or bromine atoms,
- R¹³ and R¹⁴ are also, together with the nitrogen atom to which they are bonded, a saturated heterocycle having 5 to 8 ring atoms which is optionally mono- or polysubstituted, identically or differently, by halogen or C₁-C₄-alkyl, and the heterocycle may contain 1 or 2 further, nonadjacent heteroatoms from the group of oxygen, sulphur and NR¹⁵,
- R¹⁵ is hydrogen or C₁-C₆-alkyl,

characterized in that fluoromethyl-substituted heterocycles of the formula (I)

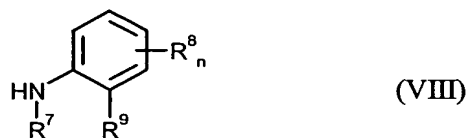


in which

R¹, R² and A are each as defined above,

5 R³ is C₁-C₆-alkyl

are hydrolyzed in the presence of a base and optionally in the presence of a diluent, and the free acid is subsequently either converted to the corresponding acid chloride in the presence of a chlorinating agent and optionally in the presence of a diluent or the free acid is reacted directly with aniline derivatives of the formula (VIII)



10

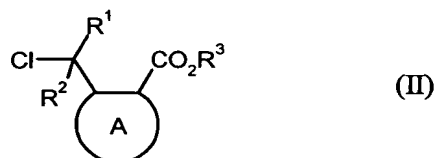
in which R⁷, R⁸, n and R⁹ are each as defined above

optionally in the presence of a catalyst, optionally in the presence of a condensing agent, optionally in the presence of an acid binding agent and optionally in the presence of a diluent.

15

12. Process according to Claim 11, characterized in that the compounds of the formula (I) are obtained by the process according to Claim 1.

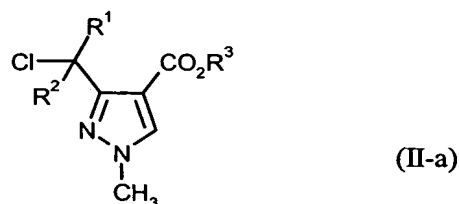
13. Chloromethyl-substituted heterocycles of the formula (II)



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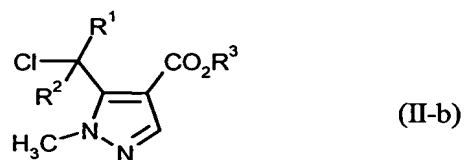
in which R¹, R², R³ and A are each as defined in Claim 1.

14. Compounds of the formula (II-a)



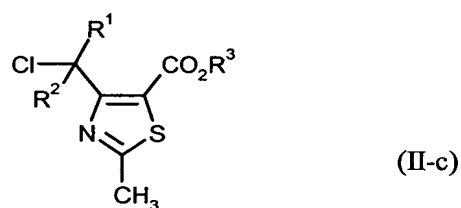
in which R^1 , R^2 and R^3 are each as defined in Claim 1.

15. Compounds of the formula (II-b)



5 in which R^1 , R^2 and R^3 are each as defined in Claim 1.

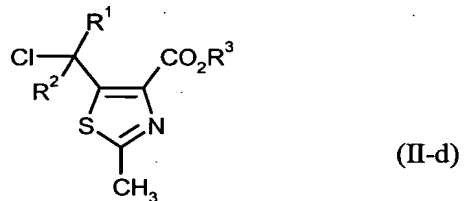
16. Compounds of the formula (II-c)



in which R^1 , R^2 and R^3 are each as defined in Claim 1.

10

17. Compounds of the formula (II-d)



in which R^1 , R^2 and R^3 are each as defined in Claim 1.